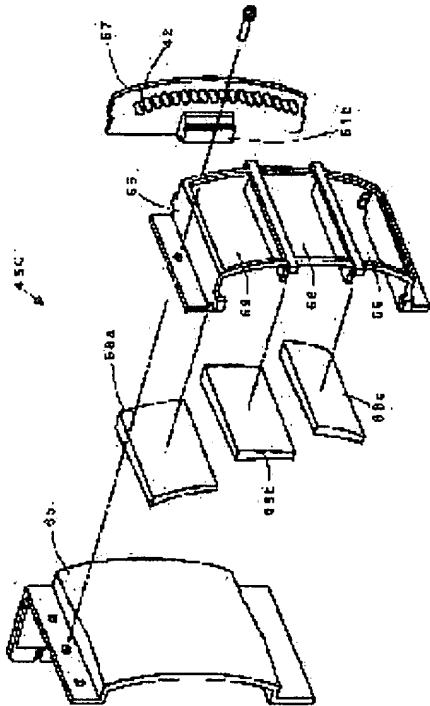


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JP 2002-143375 A

54) SLOT MACHINE



(57)Abstract:

PROBLEM TO BE SOLVED: To individually and clearly display stopping positions of respective symbols.

SOLUTION: A light source unit 46C attached with a body frame 65, a support frame 66 having three opening parts 69, and two side plates is arranged on the reverse side of a reel in a state of making the respective opening parts 69 correspond to a symbol stopping display position. Light conductive plates 68a, 68b and 68c are arranged in the rear of the respective opening parts 69, and plural LEDs 42 arranged on the front edge of one side plate 67 are inserted into one side surface of these light conductive plates 68a, 68b and 68c. The light of the respective LEDs 42 advances in the width direction of the reel while expanding in the longitudinal respective directions. The light expanded in the forward direction and the reflected light from a support surface of the body frame 65 are diffused via the light conductive plates 68a, 68b and 68c, and are introduced to the opening parts 69.

CLAIMS

[Claim(s)]

[Claim 1] Have two or more reels by which the symbol of two or more pieces was arranged by the peripheral face, and a symbol display window is received. In the slot machine which is made to suspend each reel in order after rotating each reel and indicating the symbol by fluctuation, and was made to carry out the deactivate indication of the symbol of a predetermined number into the symbol display window, respectively The light source of the number according to the number of the symbols by which a deactivate indication is carried out makes the background of each reel correspond to the deactivate indication location of a symbol, respectively, and is arranged on it. Said light source The slot machine which two or more illuminants are arranged along the direction of the fluctuation display of said symbol to one side face of this light guide plate, and changes while making said translucent part correspond to the interior of the case object which has a translucent part and arranging a light guide plate in a front face.

[Claim 2] Have two or more reels by which the symbol of two or more pieces was arranged by the peripheral face, and a symbol display window is received. In the slot machine which is made to suspend each reel in order after rotating each reel and indicating the symbol by fluctuation, and was made to carry out the deactivate indication of the symbol of a predetermined number into the symbol display window, respectively The light source unit for illuminating the deactivate indication location of each symbol according to an individual is prepared in the background of each reel. Said light source unit The slot machine which two or more illuminants are arranged along the direction of the fluctuation display of said symbol to one side face of said light guide plate, and changes while make a front face correspond to the deactivate indication location of each symbol, two or more openings are prepared, making each opening correspond and arranging a light guide plate, respectively.

[Claim 3] Said emitter is the slot machine indicated by claims 1 or 2 with possible making two or more sorts of color

light emit light alternatively.

[Claim 4] Said emitter is the slot machine indicated by either of claims 1-3 which are LED of a full color luminescence mold.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention possesses two or more reels by which the symbol of two or more pieces was arranged by the peripheral face, after it indicates the symbol by fluctuation by rotating these reels to a symbol display window, stops each reel in order and relates to the slot machine which was made to carry out the deactivate indication of the symbol of a predetermined number into the symbol display window, respectively.

[0002]

[Description of the Prior Art] On the conventional slot machine, while three reels by which two or more symbols were drawn on the peripheral surface are held in the interior of an airframe in the state of alignment, a symbol display window is formed in the location corresponding to each reel of the front face of an airframe, respectively. After each reels rotate all at once by game initiation actuation by the game person, a sequential halt is carried out in response to the halt actuation according to individual, and the deactivate indication of the three symbols is carried out into each symbol display window, respectively at this time.

[0003] According to the deactivate indication location of each symbol, slanting halt Rhine of five is formed in the formation location of each symbol display window the bottom into a top. At the time of a halt of each reel, if the combination of a specific symbol is organized on one of halt Rhine, it will be winning a prize and privileges, such as expenditure of the medal of predetermined number of sheets, will be given to a game person.

[0004] Moreover, in this kind of slot machine, the model which the halt location of each symbol is made to correspond to the background of a reel, arranges the light source, and was made to perform back lighting to specific symbols, such as a symbol on validated halt Rhine and a symbol used as winning a prize, exists. For example, while establishing the light source for back lighting for each [by which the deactivate indication was carried out] symbol of every, he arranges a gobo between each light source, and is trying to illuminate only the symbol for lighting on the slot machine indicated by JP,61-151784,U.

[0005]

[Problem(s) to be Solved by the Invention] However, it is difficult to only have used an independent miniature lamp and LED for said light source on the above-mentioned slot machine, not to be obtained in the lighting effect end of extent of making a symbol and its periphery bright, but to carve a specific symbol from other adjoining symbols clearly, and to perform the strong symbol display of impact.

[0006] Moreover, in this conventional kind of light source, since said miniature lamp and LED are made to counter a reel side and are arranged, the problem that the illumination light carries out incidence to a game person's eye, a check by looking of a symbol will be barred or a game person's eye will get fatigued by the prolonged game has occurred.

[0007] In addition, it is necessary to perform various information, such as specifying halt Rhine it not only reports formation of effective Rhine or winning a prize, but chosen by the game person with diversification of game nature, or reporting arrival of the winning-a-prize chance called per lottery and the "ten pie" for bonus games, on a slot machine in recent years. However, since the conventional light source is only a thing which makes a monochromatic color light emit light, it is impossible to perform production of performing back lighting by various color light according to the contents of the information to report.

[0008] While this invention was made paying attention to the above-mentioned trouble and displays the halt location of each symbol according to an individual clearly to each reel, it sets it as the 1st purpose to offer the slot machine which can perform back lighting which cannot make a game person's eye produce fatigue easily.

[0009] Furthermore, this invention sets it as the 2nd purpose to offer the slot machine which can perform information by the variegated back lighting by various color light according to game expansion by making two or

more sorts of color light emit light alternatively.

[0010]

[Means for Solving the Problem] It is known that there is directivity of emitting the light which advances with breadth by predetermined include-angle within the limits in emitters, such as LED and a fluorescence tubing lamp. Invention of each claim is equipped with two or more reels by which the symbol of two or more pieces was arranged by the peripheral face using this directivity, after it rotates each reel and indicates the symbol by fluctuation to a symbol display window, it stops each reel in order, and it is made to the slot machine which was made to carry out the deactivate indication of the symbol of a predetermined number into the symbol display window, respectively.

[0011] On the slot machine concerning invention of claim 1, the light source of the number according to the number of the symbols by which a deactivate indication is carried out makes the background of each reel correspond to the deactivate indication location of a symbol, respectively, and is arranged on it. While making this light source correspond to said translucent part inside the case object which has a translucent part in a front face and arranging a light guide plate, two or more illuminants are arranged along the direction of the fluctuation display of said symbol to one side face of this light guide plate.

[0012] On the slot machine concerning invention of claim 2, the light source unit for illuminating the deactivate indication location of each symbol according to an individual is prepared in the background of each reel. This light source unit is made to correspond to a front face in the deactivate indication location of each symbol, and two or more openings are prepared. Furthermore, while making each opening correspond and arranging a light guide plate, respectively, two or more illuminants are arranged along the direction of the fluctuation display of said symbol to one side face of said light guide plate.

[0013] In the configuration of said claim 1 or claim 2, making two or more sorts of color light emit light alternatively constitutes said emitter from invention of claim 3 possible.

[0014] He is trying to use LED of a full color luminescence mold as said emitter in one configuration of said claims 1-3 in invention of claim 4.

[0015]

[Function] If an emitter like LED or a fluorescence tubing lamp is attached in the internal side face of a case object in which it has a translucent part in a front face, for example according to invention of claim 1, the light from this emitter will progress in order and each up-and-down direction toward the opposed face of a case object with breadth. Therefore, in addition to the light led to the front-face side of a case object, the reflected light from a tooth back is led to the front face of a case object. Since the light which furthermore spread in these front, and the reflected light from a tooth back pass a translucent part, being spread in each front direction through a light guide plate, they can make the lighting pattern of homogeneity and the shape of a field where an illuminance is high penetrate to each symbol deactivate indication location.

[0016] Since two or more illuminants are arranged along the direction of the fluctuation display of a symbol to one side face of each light guide plate while according to invention of claim 2 opening and the light guide plate of a light source unit make it correspond, respectively and being arranged to each symbol halt location, the light from each illuminant comes to progress in each direction of order along the cross direction of a reel with breadth. Since the light which furthermore spread forward, and the reflected light from the opposed face to opening diffuse in each front direction through a light guide plate and are ahead drawn from opening, the lighting pattern of homogeneity and the shape of a field where an illuminance is high can be made to penetrate to each symbol deactivate indication location.

[0017] Moreover, since it is arranged in the condition that each emitter made the optical axis all meet crosswise [of a reel] at invention of claims 1 and 2, there is no possibility that the direct light from an emitter may go into a game person's eye.

[0018] In invention of claims 3 and 4, since it becomes possible to make two or more sorts of color light emit light alternatively in the back of each symbol deactivate indication location, it becomes possible by choosing a predetermined color light and making it emit light out of two or more sorts of color light to perform information by the back lighting of variegated color according to the flow of a game.

[0019]

[Example] As for drawing 2, the configuration inside an airframe is shown for the appearance of the slot machine with which, as for drawing 1, this invention was applied, respectively. The airframe 1 of this slot machine is attached in front opening of the body section 2 of a box configuration possible [closing motion of a door 3], and

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grows into it. the reel block 4, the circuit board 5 by which the control circuit etc. has been arranged include in the interior of the hollow of said body section 2 in an upper case location -- having -- a lower-berth location -- many -- the medal emission machine 6 which has hopper 6a which holds the medal of several sheets is incorporated.

[0020] Three reels 8a, 8b, and 8c are attached by one, and said reel block 4 grows into the metal frame 7. The band-like sheet 80 is stuck on the peripheral face of the cylinder-like frame 81, and each reels 8a, 8b, and 8c grow into it, as shown in drawing 3 . Each band-like sheet 80 is constituted by the material which has translucency like PET.

Moreover, two or more sorts of symbols S, such as a pattern, an alphabetic character, and a figure, are drawn on the front face of the band-like sheet 80, and some of the symbols constitute the winning-a-prize symbol for forming winning a prize. These reels 8a, 8b, and 8c are attached to the tie-down plates 10a, 10b, and 10c arranged in the single-sided location, respectively with the stepping motors 9a, 9b, and 9c which carry out the rotation drive of the reels 8a, 8b, and 8c according to an individual.

[0021] The body of said door 3 is constituted by the metal frame which gave predetermined thickness, and the wiring substrate (not shown) which requires three panels 11, 12, and 13 for various indicators or an actuation switch on a rear face is attached to the front opening.

[0022] The starting lever 14, the stop button switches 15a, 15b, and 15c, medal input port 16, etc. are arranged by the frame part between a front panel 11 and a lower panel 13, and the medal expenditure opening 17, the medal saucer 18, etc. are formed in it under the lower panel 13.

[0023] Said panels 11, 12, and 13 give silk screen printing to the front face of a transparent synthetic-resin plate or tempered glass, and are formed in it, and a model name, game information, etc. are drawn by an upper panel 12 and the lower panel 13. Moreover, the symbol display 20 by three symbol display windows 20a, 20b, and 20c of transparence is formed in the central front panel 11 by no coloring, respectively. Three reels 8a, 8b, and 8c of said reel block are located behind these symbol display windows 20a, 20b, and 20c, and the symbol expressed with the peripheral face of each reels 8a, 8b, and 8c from the symbol display windows 20a, 20b, and 20c can check by looking by three pieces, respectively at the time of a reel halt.

[0024] Slanting halt Rhine L1-L5 of a total of five is expressed with the front face of a front panel 11 the bottom into a top so that each symbol display windows 20a, 20b, and 20c may be crossed, as shown in drawing 4 , and at the time of a reel halt, the symbol of each reels 8a, 8b, and 8c aligns on these halt Rhine L1 - L5, respectively. In addition, halt Rhine L1-L5 is validated according to the injection number of sheets of a medal, when there is an injection number of sheets, only central halt Rhine L1 is validated, and when there is two injection number of sheets, halt Rhine L1-L3 of three of the upper inside and the bottom is validated. When the medal of three more sheets is thrown in, all halt Rhine L1-L5 is validated.

[0025] Furthermore, on the slot machine of this example, the background of each reels 8a, 8b, and 8c is made to correspond to the halt location of each symbol, and the light source 21 which emits light in the shape of a field, respectively is arranged. Each light source 21 operates according to an individual in response to the driving signal from the control section 70 which carries out a postscript, respectively, or the sub control section 78, and field-like back lighting is performed to the location which specific symbols, such as a symbol concerning winning a prize, stopped.

[0026] In the slot machine of the above-mentioned configuration, if a medal is thrown in from medal input port 16, halt Rhine of the number according to the injection number of sheets will be validated. Subsequently, if the starting lever 14 is operated, whenever three reels 8a, 8b, and 8c will start all at once and the stop button switches 15a, 15b, and 15c will be operated after this, the corresponding reels 8a, 8b, and 8c stop. On validated halt Rhine, when all the reels 8a, 8b, and 8c stop, if the combination of the symbol of winning a prize is organized, it will be winning a prize and the medal of predetermined number of sheets will be emitted to the medal saucer 18 by actuation of the medal expenditure machine 6 from the medal emission opening 17.

[0027] Drawing 5 -7 show the example of a configuration of said light source 21. In this example, the block object 40 with which LED42 used as an illuminant was inserted is put between the body frame 43 which has the back faces 43a, 43b, and 43c of three sheets corresponding to the display rectangle of a symbol, and the support frame 44 which has the opening 49 corresponding to each back faces 43a, 43b, and 43c, and light source unit 46A with which the three light sources 21 were united is formed in it.

[0028] Said block object 40 is the transparence or the translucent thing made of resin in which the dispersing agent was mixed, and as shown in drawing 7 , three holes 41 for inserting LED42 of a ramp type in a both-sides location are established, respectively. A rear face is formed in the trough type configuration where it entered inside a little in

the center section while each block object 40 is formed in the curved-surface configuration to which a front-face side projects gently ahead according to the front configuration of the support frame 44.

[0029] Each back faces 43a, 43b, and 43c of the body frame 43 take the configuration where the rear face of a block object was met, and each block object 40 is supported by each back faces 43a, 43b, and 43c and the support frame 44, respectively. In addition, each is a product made of resin and it is colored the high color of protection-from-light nature, and where said three block objects 40 are inserted, the bis-stop of each frames 43 and 44 is carried out, and they are unified.

[0030] the hole of the block object 40 with which each LED42 corresponds [the side plate 48 with which three pieces and a total of nine LED42 were arranged every block object 40 from the both-sides section] to each frames 43 and 44 and the block object 40 which were furthermore unified -- it is attached in the condition of having been inserted inside. In addition, 51a and 51b in drawing are a connector area for carrying out electrical connection of each LED42.

[0031] Generally, as shown in drawing 8, there is directivity of going on with breadth to a predetermined include angle around centering on an optical axis in the light by which outgoing radiation is carried out from LED. Therefore, according to the configuration of drawing 7, the light from LED42 of the both-sides section of the block object 40 will advance along the cross direction with breadth towards the cross direction of the block object 40, respectively, but since it is shaded by the back faces 43a, 43b, and 43c of said body frame 43, it comes to reflect it in the front, the light which spreads back progressing along with the inside of the tooth back of the block object 40. Furthermore, since the outgoing radiation light from LED42 and the reflected light from a tooth back are diffused in the various directions by the dispersing agent of the block object 40 interior, the whole front face of the block object 40 comes to emit light with homogeneity and the strong quantity of light. Moreover, by forming LED42 in the both-sides section, thickness of the light source 21 can be made thin compared with the light source of the type which carries out the matrix array of the LED and forms a field-like lighting pattern.

[0032] While the front face of said support frame 44 and the corresponding point of each side plate 48 to this frame are formed in the arc in alignment with the peripheral surface of a reel, the horizontal plates 44a and 44b which project back are formed in the vertical edge of a frame. Moreover, also between each opening 47 of the support frame 44, continuation formation of the gobo 49 which projects horizontally back is carried out, and on a reel peripheral surface, the light for every light source 21 is carved clearly, and is displayed with these horizontal plates 44a and 44b and each gobo 49.

[0033] The back faces 43a-43c of the body frame 43, each block object 40, and the width of face of each opening 47 are set as the die length according to reel width of face by each. On the other hand, the width of face of the body frame 43 whole makes only the die length which took into consideration the distance to tie-down plate 10a (10b, 10c) of said reel unit from said back faces 43a-43c project, and is formed, and the attachment section 50 which projects back in this protrusion side is really formed further. As shown in drawing 9, ** arrival of this attachment section 50 is carried out to support plate 10a (10b, 10c) for every reel.

[0034] Therefore, each light source 21 becomes the thing of a configuration of having held three block objects 40 with which three LED42 was arranged by each both sides in the space surrounded by the body frame 43, the support frame 44, and the side plate 48. By carrying out ** arrival of said attachment section 50 to support plate 10a (10b, 10c), each light source 21 is placed in a fixed position by the rear-face side of a reel by the location corresponding to each symbol display position, and the magnitude of said opening 47 and the field-like lighting pattern according to a configuration come to penetrate it to the symbol display position of a corresponding reel at the time of luminescence of the light source 21.

[0035] Three kinds of LED which emits light in red, blue, and each green color light, respectively is used for LED42 arranged in a vertical list at the both-sides section within each light source 21. As it is indicated in drawing 10 also as each light source 21, red (R) and green LED42 for each light of (G) and blue (B) reverse the direction of a list, and are arranged in the both-sides location.

[0036] When the drive circuit according to individual is established in the three light sources of said light source unit 30, respectively and the sub control section 78 (shown in drawing 23) which carries out a postscript controls each drive circuit according to an individual, it becomes possible to make each light source 21 become independent, and to make it operate. Moreover, luminescence actuation of each LED42 in the one light source 21 is controlled according to the individual for every color, and becomes possible [that this emits light in the color light of two or more colors]. Luminescence by red and green and blue three primary colors is specifically performed by making

LED42 of each color emit light independently, and also the luminescence actuation by two or more sorts besides the white light of color light can be made to perform by fluctuating the duty ratio of the driving pulse given to LED42 of each color, as shown in drawing 11 .

[0037] Drawing 12 - drawing 14 show other examples of a light source unit. Light source unit 46B of this example is the thing of a configuration of that the support frame 53 of 52 or 3 body frames and the side plate 54 with which two or more LED42 was arranged were unified. Said body frame 52 changes by the perpendicular pieces 57a and 57b of two sheets connected in the vertical direction by the support plates 55a, 55b, and 55c of three sheets formed successively, the pieces 56a, 56b, and 56c of junction of three sheets which project more back than the 1 side of each support plates 55a, 55b, and 55c, and each up-and-down support plates 55a and 55c. While, as for each support plates 55a, 55b, and 55c, central support plate 55b makes the plate surface perpendicular and it is arranged, each up-and-down support plates 55a and 55c are put in a row by central support plate 55b in the condition of having made the plate surface inclining in slanting back according to the circumferential configuration of a reel, respectively. Moreover, while the width of face of these support plates 55a-55c is formed in the die length according to reel width of face, each up-and-down perpendicular pieces 57a and 57b are formed in the width-of-face die length to which only the die length according to the distance to tie-down plate 10a by the side of the reel unit 4 (10b, 10c) projects to the support plates 55a and 55c formed successively. Furthermore in the edge for the lobe, continuation formation of the pieces 58a and 58b of attachment which project back is carried out.

[0038] First transition becomes an arc in alignment with a reel peripheral surface, a trailing edge is formed in the shape of [of the die length according to the distance between support plate 55a of the upper and lower sides of said body frame 52, and 55c] a straight line, and said side plate 54 changes. Six pieces and a total of 18 LED42 are put in order and arranged in one field of this side plate 54 by the arc along said first transition for every light source, and connector area 51a is further arranged behind these LED42. This side plate 54 doubles the arrangement side of LED42 with one side edge (side in which said piece 58 of attachment is formed) of the body frame 52, and where each LED42 is located on the back face of each support plates 55a, 55b, and 55c, it is positioned.

[0039] Each support frame 53 consists of the dark room 61 by which the rectangle-like opening 59 was established, and the pieces 62 and 62 of attachment of the pair made to project more back than the edges on both sides of this dark room 61. In addition, the protection-from-light sections 59a, 59b, 59c, and 59d projected towards the front are formed in each edge of opening 59. While the first transition section is formed in an arc, respectively, in order to extend the exposure range of light, especially the protection-from-light sections 59c and 59d of the edges on both sides of opening 59 are formed so that each field may turn to the outside of slant to said opening 59.

[0040] Where each LED42 is located on support plates 55a and 55b and 55c, after supporting a side plate 54 on the body frame 52 in the above-mentioned configuration By putting each support frame 53 on these side plates 54 and the body frame 52, and carrying out the bis-stop of each pieces 62 and 62 of attachment to the pieces 56a, 56b, and 56c of junction and side plate 54 of the body frame 52 Light source unit 46B by which each LED42 was pinched between the body frame 52 and the support frame 53 is formed. Furthermore, by carrying out the bis-stop of each pieces 58a and 58b of attachment of the body frame 52 to the inside of tie-down plate 10a (10b, 10c) of the reel unit 4, said light source unit 46B is in the condition of having made each opening 59 corresponding to a symbol deactivate indication location, and fixed support is carried out in the background location of reel 8a (8b, 8c).

[0041] In addition, since the opening 59 of said support frame 53 is formed so that it may correspond to the location which does not touch LED42 on each support plate 55a-55c, if it sees from the front, each LED42 is in the condition hidden by the dark room 61 of said support frame 53, as shown in drawing 13 and 14, and will be arranged along with the 1 side of opening 59.

[0042] The opening 59 whole is brightly illuminated by the light which the above-mentioned configuration also reflects ahead along with the back face of the light which the light from each LED42 goes to order both directions along the cross direction with breadth, and spreads ahead, and support plates 55a, 55b, and 55c. Each light source 21 Therefore, support plate 52a (52b, 52c) and the side plate 54 of one sheet, It becomes the thing of a configuration of having arranged six LED42 along the die-length direction of a reel at the 1 side of the space surrounded by the support frame 53. At the time of luminescence of the light source 21 In the symbol deactivate indication location where a reel corresponds, the field-like lighting pattern according to the magnitude of said opening 59 will penetrate. In addition, although opening 59 is formed in a front face and the field-like lighting pattern is formed in this example, it may replace with this and transparence or a translucent window part may be formed in the dark room 61 of each support frame 53.

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[0043] Furthermore, in this example, as shown in drawing 15, two LED is arranged and arranged for every [each] color of R, G, and B per light source 21, changing one color at a time. Like said example, each LED42 is a light source unit, it is driven according to an individual for every color, and it becomes possible like said light source unit 46A to switch two or more color light and to make them emit light for every light source by adjustment of duty ratio based on said drawing 20 of it.

[0044] Drawing 16 -18 show the example of a configuration of the light source unit concerning this invention. Light source unit 46C of this example is the thing of a configuration of having joined the body frame 65 and the support frame 66 which has three openings 69, where light guide plates 68a, 68b, and 68c are arranged behind each opening 69, respectively, and having inserted six LED42 in each light guide plates 68a, 68b, and 68c from the 1 side, respectively. In addition, since it is the thing of the same configuration as the body frame 43 of said 1st light source 46A, and the support frame 44, the body frame 65 and the support frame 66 omit detailed explanation of details here. Moreover, each LED42 is attached to the side plate 54 of 2nd light source 46B, and the side plate 67 of the same configuration, alignment of the side plate 70 with which this side plate 67 and LED are not arranged is carried out to the both sides of the unified body frame 65 and the support frame 66, and ** arrival of it is carried out on a screw.

[0045] each light guide plates 68a, 68b, and 68c -- the line of irregularity detailed to an order side -- it has the diffusing surface in which the pattern was formed. in addition, in this example, in order to make the diffusing surface emit light to homogeneity, it is shown in drawing 19 (1) and (2) -- as -- each light guide plates 68a, 68b, and 68c -- the other end from the insertion side of LED42 -- turning -- board thickness -- gradually -- thin -- becoming -- moreover, the line of the diffusing surface -- it forms so that a pattern may also become dense gradually. In addition, whenever [change / of said board thickness / or tilt-angle / of the diffusing surface] is set according to an individual to each light guide plates 68a and 68b and every 68c so that each diffusing surface may incline according to the curved-surface configuration of a reel.

[0046] By the above-mentioned configuration, the light from each LED42 progresses along the cross direction of a reel like said each example, spreading in each direction of order, and the light which spread forward, and the reflected light from the back face of said body frame 65 come to diffuse it in each front direction through light guide plates 68a, 68b, and 68c. Therefore, each light source 21 becomes the thing of the structure which arranged light guide plate 68a (68b, 68c) by which six LED42 was inserted in the 1 side in the body frame 65, the support frame 66, and the space surrounded by each side plates 67 and 70, is arranged to the deactivate indication location of each symbol at the reel rear face, and makes a uniform field-like lighting pattern penetrate to a reel, respectively.

[0047] In addition, although the configuration which inserted each LED42 from the side into light guide plates 68a, 68b, and 68c or the block object 40 is taken in above-mentioned light source unit 46C and the 1st above mentioned light source unit 46A, you may make it arrange each LED42 in the condition of having touched, on the side face of not only this but these dispersing agents.

[0048] In the light source 21 constituted by said light source units 46A, 46B, and 46C, the number of arrangement of LED can be sharply reduced rather than the case where LED uses the light source of the type by which the matrix array was carried out, and bright lighting can be performed to the large range, and circuitry can be simplified. And even if make an optical axis meet crosswise [of a reel], respectively, it arranges each LED, there is no possibility that the direct light from LED which is an illuminant may go into a game person's eye since lighting by the light diffused using the directivity of LED is performed and a game person gazes at the symbol display windows 20a, 20b, and 20c for a long period of time, the effectiveness of being hard to produce the fatigue of an eye is acquired.

[0049] Furthermore, in the light source units 46B and 46C, by arranging LED only on one side face, wiring is simplified and the merit that installation and drive control of a light source unit become easy is obtained. In addition, although all the three above-mentioned examples constitute the light source 21, combining LED of the monochrome luminescence mold which emits light in each color light of R, G, and B two or more, it replaces with this and you may make it introduce LED possessing each light emitting device of R, G, and B of a full color luminescence mold.

[0050] In the light source 21 by each above-mentioned configuration, it is possible to emit light in the light of homogeneity and the strong quantity of light, and since good LED of responsibility is used for the emitter, high-speed lighting actuation can be performed. Therefore, a specific symbol can be effectively directed by the discernment display by specific color light, or the display which switches each color light one by one. Moreover, it can use also for each symbol display windows 20a and 20b and the display mode (generally called "a flash plate display") which runs the band of light momentarily in 20c. Furthermore, also to the reels 8a, 8b, and 8c under

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rotation by making the same color light with high brightness like the white light or yellow light emit light to the three corresponding light sources 21. The location can be specified by illuminating brightly the symbol display windows 20a and 20b and the whole reel peripheral surface in 20c, or performing lighting by predetermined color light to specific locations, such as a place hit location of a symbol.

[0051] Drawing 20 and drawing 21 show the example of production using the back lighting by the light source 21 of one of said configurations. Two reels 8a and 8b stop drawing 20, the condition that two kinds of ten pie conditions are materialized is shown, and back lighting (a symbol S1 green and a symbol S2 yellow) which is different for every symbol kind, respectively is performed to the symbols S1 and S2 concerning each ten pie. Moreover, also in reel 8c of the right-hand side under rotation, the target position which should stop a symbol S1 and S2 is specified by each light source 21 corresponding to formation Rhine of said ten pie by performing lighting of the lighting color in the deactivate indication location of said symbols S1 and S2, and an affiliated color, respectively.

[0052] Drawing 21 shows the example which reports possibility that the internal lottery serves as a hit, with back lighting, when each reels 8a, 8b, and 8c stop in the state of a "blank." In addition, in this example, while the symbols SR and SG drawn with red and two kinds of green colors are arranged about the symbol of "7" of great success, special winning a prize from which the contents of winning a prize differ, respectively is set to each reels 8a, 8b, and 8c about the combination of "7" for every color.

[0053] Generally, on a slot machine, an internal lottery is performed in the case of reel starting, while performing "level-luffing-motion control" which draws the symbol according to said lottery result as much as possible, and is stopped to each reels 8a, 8b, and 8c, when having won said special winning a prize, a success-in-an-election result is held until the special winning a prize can draw, and a sound, light, etc. report the possibility of the success in an election to a game person further. He is trying to suggest that the possibility of winning a prize is so high that the number of symbols with which he is trying to report the possibility of winning a prize by that symbol by performing back lighting of the color of a symbol and the same color by which the deactivate indication was carried out, and the information by this back lighting was made further increases in the example of drawing 21.

[0054] According to the example of illustration, the deactivate indication of every two pieces is carried out also to red and the green symbols SR and SG of ** "7", but As opposed to back lighting of a symbol and the same color being performed to each symbol by which the deactivate indication was carried out to the red symbol SR, respectively about the green symbol SG Green back lighting of the same color is performed only to one symbol, and back lighting by different color (yellow) from a symbol is performed to the symbol of another side. Therefore, it will be suggested that possibility of having won special winning a prize which starts the red symbol SR in this case is higher.

[0055] Drawing 22 shows the example of the flash plate display which used the above-mentioned light source 21. Drawing 22 (1) - (3) has realized the flash plate display along each horizontal halt Rhine L1-L3 by switching the light source 21 made to turn on one by one at high speed to each symbol display windows 20a and 20b and every 20c. Among these, in the example of drawing 22 (1), it sets up so that each light source 21 may emit light in the same light (the example of illustration white light), and it meets horizontally and the band of the color light is run at high speed. He is trying to, heighten the display effectiveness by the after-image phenomenon by drawing 22 (2) and (3) on the other hand by making color light which is different whenever a lighting location is switched emit light.

[0056] Drawing 22 (4) and (5) show the example which switched the lighting actuation concerning the specific light source 21 one by one at high speed. In the example of drawing 22 (4), after making the light source 21 of a central symbol display position turn on, the band of light is run in each horizontal and vertical direction from the mid gear by making coincidence turn on the four light sources 21 of the upper and lower sides and right and left. Moreover, in the example of drawing 22 (5), the band of the light which runs in the direction of slant is shown by switching a lighting location to the light source 21 aslant located, respectively from the light source 21 of the upper case location of each symbol display windows 20a and 20b of the left and a center. In addition, also in these displays, it is also possible to also run the band of the light by single color light and to run two or more color light with a sequential switch.

[0057] Drawing 22 (6) is the phase which two reels (the example of illustration reels 8a and 8b of the left and a center) stopped. It is an example of a display when the "ten pie" by the symbol of "7" of the figure concerning winning a prize is materialized, and back lighting by different color light (red light) from the symbol which others do not illustrate as the symbol of "7" is performed in each stopped reels 8a and 8b. Moreover, in reel 8c under rotation, it is indicated by the flash plate, various color light being switched along a lengthwise direction.

[0058] In addition, the flash plate display shown in said drawing 22 (1) - (5) is carried out at the time of possibility that the internal lottery carried out within a control section will hit, and the symbol of winning a prize will be materialized becoming very high, the time of generating of a specially hit at the time of the bonus game called "Replay", etc.

[0059] Moreover, it is possible to perform the display by the color light of a proper according to the above mentioned special winning-a-prize conditions, such as a hit of an internal lottery and formation of Replay, respectively about both the flash plate display of the kind of drawing 22 (1) - (5) and the discernment display of the symbol by back lighting as shown in drawing 22 (6).

[0060] In addition, LED of the ultraviolet-rays luminescence mold developed recently can be introduced into the light source 21 by the above-mentioned LED. In this case, by drawing each symbol on Reels 8a and 8b and 8c with the coating containing fluorescence material, a fluorescence color is made to emit light from each symbol, and lighting production with an idea can be performed. Moreover, about the light source 21 of each above-mentioned configuration, it is also possible to replace with LED and to use a fluorescence tubing lamp and the fluorescent lamp of minute die length as an emitter.

[0061] Drawing 23 shows the electric configuration of the slot machine 1 which used the above-mentioned light source 21. 70 in drawing is a control section carried on said control board 5, and contains ROM72 the table for CPU71 and the program which are the subject of control and an operation, or lottery processing is remembered to be, RAM73 used for R/W of data, and the random number generator 74 made to generate the random number for lottery processing.

[0062] In said control section 70, various kinds of I/O sections are connected through a bus 79, and recognizing various input signals based on the program in ROM72, it gives a driving signal to the output section and CPU71 performs a series of processings in connection with a game. The medal detection sensor 75 for detecting the medal thrown in from medal input port 16 besides actuation switches, such as said starting lever 14 and the stop button switches 15a, 15b, and 15c, as the input section etc. is connected. Moreover, as the output section, a lamp, a drop, etc. for the ornament which is not illustrated besides the reel mechanical component 76 which drives the medal expenditure machine 6 and said stepping motors 9a, 9b, and 9c are connected.

[0063] Furthermore, this slot machine is made to become independent in said control section 70, and the sub control section 78 for controlling lighting actuation of each of said light source 21 is formed in it. A microcomputer is made into a control subject like [this sub control section 78] a control section 70, and the contents (for example, the combination pattern of the duty ratio of R, G, and B shown in said drawing 11 , timing of luminescence actuation, etc.) of the drive control for making each light source generate a predetermined lighting pattern are stored in that ROM (not shown).

[0064] Furthermore, various kinds of lighting patterns beforehand performed to each reels 8a, 8b, and 8c are coded and set to ROM of each control sections 70 and 78. If the code information on the lighting pattern which should be performed from the control section 70 of Maine is received, CPU in the sub-control section 78 (not shown) will read the contents of drive control required to perform the lighting pattern directed, respectively per each light source 21 from said ROM, will set them to the drive circuit (not shown) of each light source, and will realize the lighting pattern made into the purpose.

[0065] Thereby, in the control-section 70 side of Maine, since it becomes that what is necessary is just to output predetermined code information to the sub control section 78 according to the flow of a game, the burden of CPU71 can be reduced and production by various lighting patterns can be performed. However, it is not necessary to necessarily perform such control, and may be made to perform control for a game and back lighting only by the control section 70 of Maine.

[0066]

[Effect of the Invention] The light guide plate which according to invention of claims 1 and 2 was made to correspond to a symbol deactivate indication location, and was arranged, Since an illuminance is high and it was made to make the lighting pattern of the shape of a uniform field penetrate to said symbol deactivate indication location to one side face of this light guide plate using two or more illuminants arranged along the direction of the fluctuation display of a symbol It becomes possible to display each symbol display position according to an individual clearly. Moreover, since each emitter is arranged in the condition of having made the optical axis meeting crosswise [of a reel], it does not have a possibility that the direct light from an emitter may go into a game person's eye, and can perform back lighting which cannot make a game person's eye produce fatigue easily.

[0067] In invention of claims 3 and 4, since it becomes possible to make two or more sorts of color light emit light alternatively in the back of each symbol deactivate indication location, by choosing a predetermined color light and making it emit light out of two or more sorts of color light, according to the flow of a game, information by the back lighting of variegated color can be performed, and stage effects can be heightened.

[Translation done.]

TECHNICAL FIELD

[Industrial Application] This invention possesses two or more reels by which the symbol of two or more pieces was arranged by the peripheral face, after it indicates the symbol by fluctuation by rotating these reels to a symbol display window, stops each reel in order and relates to the slot machine which was made to carry out the deactivate indication of the symbol of a predetermined number into the symbol display window, respectively.

[Translation done.]

PRIOR ART

[Description of the Prior Art] On the conventional slot machine, while three reels by which two or more symbols were drawn on the peripheral surface are held in the interior of an airframe in the state of alignment, a symbol display window is formed in the location corresponding to each reel of the front face of an airframe, respectively. After each reels rotate all at once by game initiation actuation by the game person, a sequential halt is carried out in response to the halt actuation according to individual, and the deactivate indication of the three symbols is carried out into each symbol display window, respectively at this time.

[0003] According to the deactivate indication location of each symbol, slanting halt Rhine of five is formed in the formation location of each symbol display window the bottom into a top. At the time of a halt of each reel, if the combination of a specific symbol is organized on one of halt Rhine, it will be winning a prize and privileges, such as expenditure of the medal of predetermined number of sheets, will be given to a game person.

[0004] Moreover, in this kind of slot machine, the model which the halt location of each symbol is made to correspond to the background of a reel, arranges the light source, and was made to perform back lighting to specific symbols, such as a symbol on validated halt Rhine and a symbol used as winning a prize, exists. For example, while establishing the light source for back lighting for each [by which the deactivate indication was carried out] symbol of every, he arranges a gobo between each light source, and is trying to illuminate only the symbol for lighting on the slot machine indicated by JP,61-151784,U.

[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention] The light guide plate which according to invention of claims 1 and 2 was made to correspond to a symbol deactivate indication location, and was arranged, Since an illuminance is high and it was made to make the lighting pattern of the shape of a uniform field penetrate to said symbol deactivate indication location to one side face of this light guide plate using two or more illuminants arranged along the direction of the fluctuation display of a symbol It becomes possible to display each symbol display position according to an individual clearly. Moreover, since each emitter is arranged in the condition of having made the optical axis meeting crosswise [of a reel], it does not have a possibility that the direct light from an emitter may go into a game person's

eye, and can perform back lighting which cannot make a game person's eye produce fatigue easily.

[0067] In invention of claims 3 and 4, since it becomes possible to make two or more sorts of color light emit light alternatively in the back of each symbol deactivate indication location, by choosing a predetermined color light and making it emit light out of two or more sorts of color light, according to the flow of a game, information by the back lighting of variegated color can be performed, and stage effects can be heightened.

[Translation done.]

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, it is difficult to only have used an independent miniature lamp and LED for said light source on the above-mentioned slot machine, not to be obtained in the lighting effect end of extent of making a symbol and its periphery bright, but to carve a specific symbol from other adjoining symbols clearly, and to perform the strong symbol display of impact.

[0006] Moreover, in this conventional kind of light source, since said miniature lamp and LED are made to counter a reel side and are arranged, the problem that the illumination light carries out incidence to a game person's eye, a check by looking of a symbol will be barred or a game person's eye will get fatigued by the prolonged game has occurred.

[0007] In addition, it is necessary to perform various information, such as specifying halt Rhine it not only reports formation of effective Rhine or winning a prize, but chosen by the game person with diversification of game nature, or reporting arrival of the winning-a-prize chance called per lottery and the "ten pie" for bonus games, on a slot machine in recent years. However, since the conventional light source is only a thing which makes a monochromatic color light emit light, it is impossible to perform production of performing back lighting by various color light according to the contents of the information to report.

[0008] While this invention was made paying attention to the above-mentioned trouble and displays the halt location of each symbol according to an individual clearly to each reel, it sets it as the 1st purpose to offer the slot machine which can perform back lighting which cannot make a game person's eye produce fatigue easily.

[0009] Furthermore, this invention sets it as the 2nd purpose to offer the slot machine which can perform information by the variegated back lighting by various color light according to game expansion by making two or more sorts of color light emit light alternatively.

[Translation done.]

MEANS

[Means for Solving the Problem] It is known that there is directivity of emitting the light which advances with breadth by predetermined include-angle within the limits in emitters, such as LED and a fluorescence tubing lamp. Invention of each claim is equipped with two or more reels by which the symbol of two or more pieces was arranged by the peripheral face using this directivity, after it rotates each reel and indicates the symbol by fluctuation to a symbol display window, it stops each reel in order, and it is made to the slot machine which was made to carry out the deactivate indication of the symbol of a predetermined number into the symbol display window, respectively.

[0011] On the slot machine concerning invention of claim 1, the light source of the number according to the number of the symbols by which a deactivate indication is carried out makes the background of each reel correspond to the deactivate indication location of a symbol, respectively, and is arranged on it. While making this light source correspond to said translucent part inside the case object which has a translucent part in a front face and arranging a light guide plate, two or more illuminants are arranged along the direction of the fluctuation display of said symbol

to one side face of this light guide plate.

[0012] On the slot machine concerning invention of claim 2, the light source unit for illuminating the deactivate indication location of each symbol according to an individual is prepared in the background of each reel. This light source unit is made to correspond to a front face in the deactivate indication location of each symbol, and two or more openings are prepared. Furthermore, while making each opening correspond and arranging a light guide plate, respectively, two or more illuminants are arranged along the direction of the fluctuation display of said symbol to one side face of said light guide plate.

[0013] In the configuration of said claim 1 or claim 2, making two or more sorts of color light emit light alternatively constitutes said emitter from invention of claim 3 possible.

[0014] He is trying to use LED of a full color luminescence mold as said emitter in one configuration of said claims 1-3 in invention of claim 4.

[Translation done.]

OPERATION

[Function] If an emitter like LED or a fluorescence tubing lamp is attached in the internal side face of a case object in which it has a translucent part in a front face, for example according to invention of claim 1, the light from this emitter will progress in order and each up-and-down direction toward the opposed face of a case object with breadth. Therefore, in addition to the light led to the front-face side of a case object, the reflected light from a tooth back is led to the front face of a case object. Since the light which furthermore spread in these front, and the reflected light from a tooth back pass a translucent part, being spread in each front direction through a light guide plate, they can make the lighting pattern of homogeneity and the shape of a field where an illuminance is high penetrate to each symbol deactivate indication location.

[0016] Since two or more illuminants are arranged along the direction of the fluctuation display of a symbol to one side face of each light guide plate while according to invention of claim 2 opening and the light guide plate of a light source unit make it correspond, respectively and being arranged to each symbol halt location, the light from each illuminant comes to progress in each direction of order along the cross direction of a reel with breadth. Since the light which furthermore spread forward, and the reflected light from the opposed face to opening diffuse in each front direction through a light guide plate and are ahead drawn from opening, the lighting pattern of homogeneity and the shape of a field where an illuminance is high can be made to penetrate to each symbol deactivate indication location.

[0017] Moreover, since it is arranged in the condition that each emitter made the optical axis all meet crosswise [of a reel] at invention of claims 1 and 2, there is no possibility that the direct light from an emitter may go into a game person's eye.

[0018] In invention of claims 3 and 4, since it becomes possible to make two or more sorts of color light emit light alternatively in the back of each symbol deactivate indication location, it becomes possible by choosing a predetermined color light and making it emit light out of two or more sorts of color light to perform information by the back lighting of variegated color according to the flow of a game.

[Translation done.]

EXAMPLE

document property name.**Art Unit: Error! Unknown document property name.**

[Example] As for drawing 2 , the configuration inside an airframe is shown for the appearance of the slot machine with which, as for drawing 1 , this invention was applied, respectively. The airframe 1 of this slot machine is attached in front opening of the body section 2 of a box configuration possible [closing motion of a door 3], and grows into it. the reel block 4, the circuit board 5 by which the control circuit etc. has been arranged include in the interior of the hollow of said body section 2 in an upper case location -- having -- a lower-berth location -- many -- the medal emission machine 6 which has hopper 6a which holds the medal of several sheets is incorporated.

[0020] Three reels 8a, 8b, and 8c are attached by one, and said reel block 4 grows into the metal frame 7. The band-like sheet 80 is stuck on the peripheral face of the cylinder-like frame 81, and each reels 8a, 8b, and 8c grow into it, as shown in drawing 3 . Each band-like sheet 80 is constituted by the material which has translucency like PET. Moreover, two or more sorts of symbols S, such as a pattern, an alphabetic character, and a figure, are drawn on the front face of the band-like sheet 80, and some of the symbols constitute the winning-a-prize symbol for forming winning a prize. These reels 8a, 8b, and 8c are attached to the tie-down plates 10a, 10b, and 10c arranged in the single-sided location, respectively with the stepping motors 9a, 9b, and 9c which carry out the rotation drive of the reels 8a, 8b, and 8c according to an individual.

[0021] The body of said door 3 is constituted by the metal frame which gave predetermined thickness, and the wiring substrate (not shown) which requires three panels 11, 12, and 13 for various indicators or an actuation switch on a rear face is attached to the front opening.

[0022] The starting lever 14, the stop button switches 15a, 15b, and 15c, medal input port 16, etc. are arranged by the frame part between a front panel 11 and a lower panel 13, and the medal expenditure opening 17, the medal saucer 18, etc. are formed in it under the lower panel 13.

[0023] Said panels 11, 12, and 13 give silk screen printing to the front face of a transparent synthetic-resin plate or tempered glass, and are formed in it, and a model name, game information, etc. are drawn by an upper panel 12 and the lower panel 13. Moreover, the symbol display 20 by three symbol display windows 20a, 20b, and 20c of transparence is formed in the central front panel 11 by no coloring, respectively. Three reels 8a, 8b, and 8c of said reel block are located behind these symbol display windows 20a, 20b, and 20c, and the symbol expressed with the peripheral face of each reels 8a, 8b, and 8c from the symbol display windows 20a, 20b, and 20c can check by looking by three pieces, respectively at the time of a reel halt.

[0024] Slanting halt Rhine L1-L5 of a total of five is expressed with the front face of a front panel 11 the bottom into a top so that each symbol display windows 20a, 20b, and 20c may be crossed, as shown in drawing 4 , and at the time of a reel halt, the symbol of each reels 8a, 8b, and 8c aligns on these halt Rhine L1 - L5, respectively. In addition, halt Rhine L1-L5 is validated according to the injection number of sheets of a medal, when there is an injection number of sheets, only central halt Rhine L1 is validated, and when there is two injection number of sheets, halt Rhine L1-L3 of three of the upper inside and the bottom is validated. When the medal of three more sheets is thrown in, all halt Rhine L1-L5 is validated.

[0025] Furthermore, on the slot machine of this example, the background of each reels 8a, 8b, and 8c is made to correspond to the halt location of each symbol, and the light source 21 which emits light in the shape of a field, respectively is arranged. Each light source 21 operates according to an individual in response to the driving signal from the control section 70 which carries out a postscript, respectively, or the sub control section 78, and field-like back lighting is performed to the location which specific symbols, such as a symbol concerning winning a prize, stopped.

[0026] In the slot machine of the above-mentioned configuration, if a medal is thrown in from medal input port 16, halt Rhine of the number according to the injection number of sheets will be validated. Subsequently, if the starting lever 14 is operated, whenever three reels 8a, 8b, and 8c will start all at once and the stop button switches 15a, 15b, and 15c will be operated after this, the corresponding reels 8a, 8b, and 8c stop. On validated halt Rhine, when all the reels 8a, 8b, and 8c stop, if the combination of the symbol of winning a prize is organized, it will be winning a prize and the medal of predetermined number of sheets will be emitted to the medal saucer 18 by actuation of the medal expenditure machine 6 from the medal emission opening 17.

[0027] Drawing 5 -7 show the example of a configuration of said light source 21. In this example, the block object 40 with which LED42 used as an illuminant was inserted is put between the body frame 43 which has the back faces 43a, 43b, and 43c of three sheets corresponding to the display rectangle of a symbol, and the support frame 44 which has the opening 49 corresponding to each back faces 43a, 43b, and 43c, and light source unit 46A with which the three light sources 21 were united is formed in it.

[0028] Said block object 40 is the transparence or the translucent thing made of resin in which the dispersing agent was mixed, and as shown in drawing 7, three holes 41 for inserting LED42 of a ramp type in a both-sides location are established, respectively. A rear face is formed in the trough type configuration where it entered inside a little in the center section while each block object 40 is formed in the curved-surface configuration to which a front-face side projects gently ahead according to the front configuration of the support frame 44.

[0029] Each back faces 43a, 43b, and 43c of the body frame 43 take the configuration where the rear face of a block object was met, and each block object 40 is supported by each back faces 43a, 43b, and 43c and the support frame 44, respectively. In addition, each is a product made of resin and it is colored the high color of protection-from-light nature, and where said three block objects 40 are inserted, the bis-stop of each frames 43 and 44 is carried out, and they are unified.

[0030] the hole of the block object 40 with which each LED42 corresponds [the side plate 48 with which three pieces and a total of nine LED42 were arranged every block object 40 from the both-sides section] to each frames 43 and 44 and the block object 40 which were furthermore unified -- it is attached in the condition of having been inserted inside. In addition, 51a and 51b in drawing are a connector area for carrying out electrical connection of each LED42.

[0031] Generally, as shown in drawing 8, there is directivity of going on with breadth to a predetermined include angle around centering on an optical axis in the light by which outgoing radiation is carried out from LED. Therefore, according to the configuration of drawing 7, the light from LED42 of the both-sides section of the block object 40 will advance along the cross direction with breadth towards the cross direction of the block object 40, respectively, but since it is shaded by the back faces 43a, 43b, and 43c of said body frame 43, it comes to reflect it in the front, the light which spreads back progressing along with the inside of the tooth back of the block object 40. Furthermore, since the outgoing radiation light from LED42 and the reflected light from a tooth back are diffused in the various directions by the dispersing agent of the block object 40 interior, the whole front face of the block object 40 comes to emit light with homogeneity and the strong quantity of light. Moreover, by forming LED42 in the both-sides section, thickness of the light source 21 can be made thin compared with the light source of the type which carries out the matrix array of the LED and forms a field-like lighting pattern.

[0032] While the front face of said support frame 44 and the corresponding point of each side plate 48 to this frame are formed in the arc in alignment with the peripheral surface of a reel, the horizontal plates 44a and 44b which project back are formed in the vertical edge of a frame. Moreover, also between each opening 47 of the support frame 44, continuation formation of the gobo 49 which projects horizontally back is carried out, and on a reel peripheral surface, the light for every light source 21 is carved clearly, and is displayed with these horizontal plates 44a and 44b and each gobo 49.

[0033] The back faces 43a-43c of the body frame 43, each block object 40, and the width of face of each opening 47 are set as the die length according to reel width of face by each. On the other hand, the width of face of the body frame 43 whole makes only the die length which took into consideration the distance to tie-down plate 10a (10b, 10c) of said reel unit from said back faces 43a-43c project, and is formed, and the attachment section 50 which projects back in this protrusion side is really formed further. As shown in drawing 9, ** arrival of this attachment section 50 is carried out to support plate 10a (10b, 10c) for every reel.

[0034] Therefore, each light source 21 becomes the thing of a configuration of having held three block objects 40 with which three LED42 was arranged by each both sides in the space surrounded by the body frame 43, the support frame 44, and the side plate 48. By carrying out ** arrival of said attachment section 50 to support plate 10a (10b, 10c), each light source 21 is placed in a fixed position by the rear-face side of a reel by the location corresponding to each symbol display position, and the magnitude of said opening 47 and the field-like lighting pattern according to a configuration come to penetrate it to the symbol display position of a corresponding reel at the time of luminescence of the light source 21.

[0035] Three kinds of LED which emits light in red, blue, and each green color light, respectively is used for LED42 arranged in a vertical list at the both-sides section within each light source 21. As it is indicated in drawing 10 also as each light source 21, red (R) and green LED42 for each light of (G) and blue (B) reverse the direction of a list, and are arranged in the both-sides location.

[0036] When the drive circuit according to individual is established in the three light sources of said light source unit 30, respectively and the sub control section 78 (shown in drawing 23) which carries out a postscript controls each drive circuit according to an individual, it becomes possible to make each light source 21 become independent, and

to make it operate. Moreover, luminescence actuation of each LED42 in the one light source 21 is controlled according to the individual for every color, and becomes possible [that this emits light in the color light of two or more colors]. Luminescence by red and green and blue three primary colors is specifically performed by making LED42 of each color emit light independently, and also the luminescence actuation by two or more sorts besides the white light of color light can be made to perform by fluctuating the duty ratio of the driving pulse given to LED42 of each color, as shown in drawing 11 .

[0037] Drawing 12 - drawing 14 show other examples of a light source unit. Light source unit 46B of this example is the thing of a configuration of that the support frame 53 of 52 or 3 body frames and the side plate 54 with which two or more LED42 was arranged were unified. Said body frame 52 changes by the perpendicular pieces 57a and 57b of two sheets connected in the vertical direction by the support plates 55a, 55b, and 55c of three sheets formed successively, the pieces 56a, 56b, and 56c of junction of three sheets which project more back than the 1 side of each support plates 55a, 55b, and 55c, and each up-and-down support plates 55a and 55c. While, as for each support plates 55a, 55b, and 55c, central support plate 55b makes the plate surface perpendicular and it is arranged, each up-and-down support plates 55a and 55c are put in a row by central support plate 55b in the condition of having made the plate surface inclining in slanting back according to the circumferential configuration of a reel, respectively. Moreover, while the width of face of these support plates 55a-55c is formed in the die length according to reel width of face, each up-and-down perpendicular pieces 57a and 57b are formed in the width-of-face die length to which only the die length according to the distance to tie-down plate 10a by the side of the reel unit 4 (10b, 10c) projects to the support plates 55a and 55c formed successively. Furthermore in the edge for the lobe, continuation formation of the pieces 58a and 58b of attachment which project back is carried out.

[0038] First transition becomes an arc in alignment with a reel peripheral surface, a trailing edge is formed in the shape of [of the die length according to the distance between support plate 55a of the upper and lower sides of said body frame 52, and 55c] a straight line, and said side plate 54 changes. Six pieces and a total of 18 LED42 are put in order and arranged in one field of this side plate 54 by the arc along said first transition for every light source, and connector area 51a is further arranged behind these LED42. This side plate 54 doubles the arrangement side of LED42 with one side edge (side in which said piece 58 of attachment is formed) of the body frame 52, and where each LED42 is located on the back face of each support plates 55a, 55b, and 55c, it is positioned.

[0039] Each support frame 53 consists of the dark room 61 by which the rectangle-like opening 59 was established, and the pieces 62 and 62 of attachment of the pair made to project more back than the edges on both sides of this dark room 61. In addition, the protection-from-light sections 59a, 59b, 59c, and 59d projected towards the front are formed in each edge of opening 59. While the first transition section is formed in an arc, respectively, in order to extend the exposure range of light, especially the protection-from-light sections 59c and 59d of the edges on both sides of opening 59 are formed so that each field may turn to the outside of slant to said opening 59.

[0040] Where each LED42 is located on support plates 55a and 55b and 55c, after supporting a side plate 54 on the body frame 52 in the above-mentioned configuration By putting each support frame 53 on these side plates 54 and the body frame 52, and carrying out the bis-stop of each pieces 62 and 62 of attachment to the pieces 56a, 56b, and 56c of junction and side plate 54 of the body frame 52 Light source unit 46B by which each LED42 was pinched between the body frame 52 and the support frame 53 is formed. Furthermore, by carrying out the bis-stop of each pieces 58a and 58b of attachment of the body frame 52 to the inside of tie-down plate 10a (10b, 10c) of the reel unit 4, said light source unit 46B is in the condition of having made each opening 59 corresponding to a symbol deactivate indication location, and fixed support is carried out in the background location of reel 8a (8b, 8c).

[0041] In addition, since the opening 59 of said support frame 53 is formed so that it may correspond to the location which does not touch LED42 on each support plate 55a-55c, if it sees from the front, each LED42 is in the condition hidden by the dark room 61 of said support frame 53, as shown in drawing 13 and 14, and will be arranged along with the 1 side of opening 59.

[0042] The opening 59 whole is brightly illuminated by the light which the above-mentioned configuration also reflects ahead along with the back face of the light which the light from each LED42 goes to order both directions along the cross direction with breadth, and spreads ahead, and support plates 55a, 55b, and 55c. Each light source 21 Therefore, support plate 52a (52b, 52c) and the side plate 54 of one sheet, It becomes the thing of a configuration of having arranged six LED42 along the die-length direction of a reel at the 1 side of the space surrounded by the support frame 53. At the time of luminescence of the light source 21 In the symbol deactivate indication location where a reel corresponds, the field-like lighting pattern according to the magnitude of said opening 59 will penetrate.

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In addition, although opening 59 is formed in a front face and the field-like lighting pattern is formed in this example, it may replace with this and transparency or a translucent window part may be formed in the dark room 61 of each support frame 53.

[0043] Furthermore, in this example, as shown in drawing 15, two LED is arranged and arranged for every [each] color of R, G, and B per light source 21, changing one color at a time. Like said example, each LED42 is a light source unit, it is driven according to an individual for every color, and it becomes possible like said light source unit 46A to switch two or more color light and to make them emit light for every light source by adjustment of duty ratio based on said drawing 20 of it.

[0044] Drawing 16 -18 show the example of a configuration of the light source unit concerning this invention. Light source unit 46C of this example is the thing of a configuration of having joined the body frame 65 and the support frame 66 which has three openings 69, where light guide plates 68a, 68b, and 68c are arranged behind each opening 69, respectively, and having inserted six LED42 in each light guide plates 68a, 68b, and 68c from the 1 side, respectively. In addition, since it is the thing of the same configuration as the body frame 43 of said 1st light source 46A, and the support frame 44, the body frame 65 and the support frame 66 omit detailed explanation of details here. Moreover, each LED42 is attached to the side plate 54 of 2nd light source 46B, and the side plate 67 of the same configuration, alignment of the side plate 70 with which this side plate 67 and LED are not arranged is carried out to the both sides of the unified body frame 65 and the support frame 66, and ** arrival of it is carried out on a screw.

[0045] each light guide plates 68a, 68b, and 68c -- the line of irregularity detailed to an order side -- it has the diffusing surface in which the pattern was formed. in addition, in this example, in order to make the diffusing surface emit light to homogeneity, it is shown in drawing 19 (1) and (2) -- as -- each light guide plates 68a, 68b, and 68c -- the other end from the insertion side of LED42 -- turning -- board thickness -- gradually -- thin -- becoming -- moreover, the line of the diffusing surface -- it forms so that a pattern may also become dense gradually. In addition, whenever [change / of said board thickness / or tilt-angle / of the diffusing surface] is set according to an individual to each light guide plates 68a and 68b and every 68c so that each diffusing surface may incline according to the curved-surface configuration of a reel.

[0046] By the above-mentioned configuration, the light from each LED42 progresses along the cross direction of a reel like said each example, spreading in each direction of order, and the light which spread forward, and the reflected light from the back face of said body frame 65 come to diffuse it in each front direction through light guide plates 68a, 68b, and 68c. Therefore, each light source 21 becomes the thing of the structure which arranged light guide plate 68a (68b, 68c) by which six LED42 was inserted in the 1 side in the body frame 65, the support frame 66, and the space surrounded by each side plates 67 and 70, is arranged to the deactivate indication location of each symbol at the reel rear face, and makes a uniform field-like lighting pattern penetrate to a reel, respectively.

[0047] In addition, although the configuration which inserted each LED42 from the side into light guide plates 68a, 68b, and 68c or the block object 40 is taken in above-mentioned light source unit 46C and the 1st above mentioned light source unit 46A, you may make it arrange each LED42 in the condition of having touched, on the side face of not only this but these dispersing agents.

[0048] In the light source 21 constituted by said light source units 46A, 46B, and 46C, the number of arrangement of LED can be sharply reduced rather than the case where LED uses the light source of the type by which the matrix array was carried out, and bright lighting can be performed to the large range, and circuitry can be simplified. And even if make an optical axis meet crosswise [of a reel], respectively, it arranges each LED, there is no possibility that the direct light from LED which is an illuminant may go into a game person's eye since lighting by the light diffused using the directivity of LED is performed and a game person gazes at the symbol display windows 20a, 20b, and 20c for a long period of time, the effectiveness of being hard to produce the fatigue of an eye is acquired.

[0049] Furthermore, in the light source units 46B and 46C, by arranging LED only on one side face, wiring is simplified and the merit that installation and drive control of a light source unit become easy is obtained. In addition, although all the three above-mentioned examples constitute the light source 21, combining LED of the monochrome luminescence mold which emits light in each color light of R, G, and B two or more, it replaces with this and you may make it introduce LED possessing each light emitting device of R, G, and B of a full color luminescence mold.

[0050] In the light source 21 by each above-mentioned configuration, it is possible to emit light in the light of homogeneity and the strong quantity of light, and since good LED of responsibility is used for the emitter, high-speed lighting actuation can be performed. Therefore, a specific symbol can be effectively directed by the

discernment display by specific color light, or the display which switches each color light one by one. Moreover, it can use also for each symbol display windows 20a and 20b and the display mode (generally called "a flash plate display") which runs the band of light momentarily in 20c. Furthermore, also to the reels 8a, 8b, and 8c under rotation by making the same color light with high brightness like the white light or yellow light emit light to the three corresponding light sources 21. The location can be specified by illuminating brightly the symbol display windows 20a and 20b and the whole reel peripheral surface in 20c, or performing lighting by predetermined color light to specific locations, such as a place hit location of a symbol.

[0051] Drawing 20 and drawing 21 show the example of production using the back lighting by the light source 21 of one of said configurations. Two reels 8a and 8b stop drawing 20, the condition that two kinds of ten pie conditions are materialized is shown, and back lighting (a symbol S1 green and a symbol S2 yellow) which is different for every symbol kind, respectively is performed to the symbols S1 and S2 concerning each ten pie. Moreover, also in reel 8c of the right-hand side under rotation, the target position which should stop a symbol S1 and S2 is specified by each light source 21 corresponding to formation Rhine of said ten pie by performing lighting of the lighting color in the deactivate indication location of said symbols S1 and S2, and an affiliated color, respectively.

[0052] Drawing 21 shows the example which reports possibility that the internal lottery serves as a hit, with back lighting, when each reels 8a, 8b, and 8c stop in the state of a "blank." In addition, in this example, while the symbols SR and SG drawn with red and two kinds of green colors are arranged about the symbol of "7" of great success, special winning a prize from which the contents of winning a prize differ, respectively is set to each reels 8a, 8b, and 8c about the combination of "7" for every color.

[0053] Generally, on a slot machine, an internal lottery is performed in the case of reel starting, while performing "level-luffing-motion control" which draws the symbol according to said lottery result as much as possible, and is stopped to each reels 8a, 8b, and 8c, when having won said special winning a prize, a success-in-an-election result is held until the special winning a prize can draw, and a sound, light, etc. report the possibility of the success in an election to a game person further. He is trying to suggest that the possibility of winning a prize is so high that the number of symbols with which he is trying to report the possibility of winning a prize by that symbol by performing back lighting of the color of a symbol and the same color by which the deactivate indication was carried out, and the information by this back lighting was made further increases in the example of drawing 21.

[0054] According to the example of illustration, the deactivate indication of every two pieces is carried out also to red and the green symbols SR and SG of ** "7", but As opposed to back lighting of a symbol and the same color being performed to each symbol by which the deactivate indication was carried out to the red symbol SR, respectively about the green symbol SG Green back lighting of the same color is performed only to one symbol, and back lighting by different color (yellow) from a symbol is performed to the symbol of another side. Therefore, it will be suggested that possibility of having won special winning a prize which starts the red symbol SR in this case is higher.

[0055] Drawing 22 shows the example of the flash plate display which used the above-mentioned light source 21. Drawing 22 (1) - (3) has realized the flash plate display along each horizontal halt Rhine L1-L3 by switching the light source 21 made to turn on one by one at high speed to each symbol display windows 20a and 20b and every 20c. Among these, in the example of drawing 22 (1), it sets up so that each light source 21 may emit light in the same light (the example of illustration white light), and it meets horizontally and the band of the color light is run at high speed. He is trying to, heighten the display effectiveness by the after-image phenomenon by drawing 22 (2) and (3) on the other hand by making color light which is different whenever a lighting location is switched emit light.

[0056] Drawing 22 (4) and (5) show the example which switched the lighting actuation concerning the specific light source 21 one by one at high speed. In the example of drawing 22 (4), after making the light source 21 of a central symbol display position turn on, the band of light is run in each horizontal and vertical direction from the mid gear by making coincidence turn on the four light sources 21 of the upper and lower sides and right and left. Moreover, in the example of drawing 22 (5), the band of the light which runs in the direction of slant is shown by switching a lighting location to the light source 21 aslant located, respectively from the light source 21 of the upper case location of each symbol display windows 20a and 20b of the left and a center. In addition, also in these displays, it is also possible to also run the band of the light by single color light and to run two or more color light with a sequential switch.

[0057] Drawing 22 (6) is the phase which two reels (the example of illustration reels 8a and 8b of the left and a center) stopped. It is an example of a display when the "ten pie" by the symbol of "7" of the figure concerning

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winning a prize is materialized, and back lighting by different color light (red light) from the symbol which others do not illustrate as the symbol of "7" is performed in each stopped reels 8a and 8b. Moreover, in reel 8c under rotation, it is indicated by the flash plate, various color light being switched along a lengthwise direction.

[0058] In addition, the flash plate display shown in said drawing 22 (1) - (5) is carried out at the time of possibility that the internal lottery carried out within a control section will hit, and the symbol of winning a prize will be materialized becoming very high, the time of generating of a specially hit at the time of the bonus game called "Replay", etc.

[0059] Moreover, it is possible to perform the display by the color light of a proper according to the above mentioned special winning-a-prize conditions, such as a hit of an internal lottery and formation of Replay, respectively about both the flash plate display of the kind of drawing 22 (1) - (5) and the discernment display of the symbol by back lighting as shown in drawing 22 (6).

[0060] In addition, LED of the ultraviolet-rays luminescence mold developed recently can be introduced into the light source 21 by the above-mentioned LED. In this case, by drawing each symbol on Reels 8a and 8b and 8c with the coating containing fluorescence material, a fluorescence color is made to emit light from each symbol, and lighting production with an idea can be performed. Moreover, about the light source 21 of each above-mentioned configuration, it is also possible to replace with LED and to use a fluorescence tubing lamp and the fluorescent lamp of minute die length as an emitter.

[0061] Drawing 23 shows the electric configuration of the slot machine 1 which used the above-mentioned light source 21. 70 in drawing is a control section carried on said control board 5, and contains ROM72 the table for CPU71 and the program which are the subject of control and an operation, or lottery processing is remembered to be, RAM73 used for R/W of data, and the random number generator 74 made to generate the random number for lottery processing.

[0062] In said control section 70, various kinds of I/O sections are connected through a bus 79, and recognizing various input signals based on the program in ROM72, it gives a driving signal to the output section and CPU71 performs a series of processings in connection with a game. The medal detection sensor 75 for detecting the medal thrown in from medal input port 16 besides actuation switches, such as said starting lever 14 and the stop button switches 15a, 15b, and 15c, as the input section etc. is connected. Moreover, as the output section, a lamp, a drop, etc. for the ornament which is not illustrated besides the reel mechanical component 76 which drives the medal expenditure machine 6 and said stepping motors 9a, 9b, and 9c are connected.

[0063] Furthermore, this slot machine is made to become independent in said control section 70, and the sub control section 78 for controlling lighting actuation of each of said light source 21 is formed in it. A microcomputer is made into a control subject like [this sub control section 78] a control section 70, and the contents (for example, the combination pattern of the duty ratio of R, G, and B shown in said drawing 11 , timing of luminescence actuation, etc.) of the drive control for making each light source generate a predetermined lighting pattern are stored in that ROM (not shown).

[0064] Furthermore, various kinds of lighting patterns beforehand performed to each reels 8a, 8b, and 8c are coded and set to ROM of each control sections 70 and 78. If the code information on the lighting pattern which should be performed from the control section 70 of Maine is received, CPU in the sub-control section 78 (not shown) will read the contents of drive control required to perform the lighting pattern directed, respectively per each light source 21 from said ROM, will set them to the drive circuit (not shown) of each light source, and will realize the lighting pattern made into the purpose.

[0065] Thereby, in the control-section 70 side of Maine, since it becomes that what is necessary is just to output predetermined code information to the sub control section 78 according to the flow of a game, the burden of CPU71 can be reduced and production by various lighting patterns can be performed. However, it is not necessary to necessarily perform such control, and may be made to perform control for a game and back lighting only by the control section 70 of Maine.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the perspective view showing the appearance of the slot machine concerning one example of this invention.

[Drawing 2] It is the front view showing the internal structure of a slot machine.

[Drawing 3] It is the perspective view showing the configuration of a reel.

[Drawing 4] It is the front view showing the configuration of a symbol display.

[Drawing 5] It is the perspective view showing the example of a light source unit.

[Drawing 6] It is the decomposition perspective view showing the configuration of the light source unit of drawing 5

[Drawing 7] They are the front view showing the configuration of the block object built into the light source unit of drawing 5, a top view, and a side elevation.

[Drawing 8] It is the explanatory view showing the directivity of LED.

[Drawing 9] It is the perspective view showing the approach to the reel of the light source unit of drawing 5 "cling."

[Drawing 10] It is the explanatory view showing the example of arrangement of LED within each light source.

[Drawing 11] It is the explanatory view showing the combination of the duty ratio of the driving pulse to LED for making two or more sorts of color light emit light.

[Drawing 12] It is the decomposition perspective view showing the 2nd example of a light source unit.

[Drawing 13] They are the front view of the light source unit of drawing 12, and a side elevation.

[Drawing 14] It is the sectional view of the light source unit of drawing 12.

[Drawing 15] It is the front view showing the example of arrangement of LED on a side plate.

[Drawing 16] It is the perspective view showing the example of a configuration of the light source unit concerning this invention.

[Drawing 17] It is the decomposition perspective view of the light source unit of drawing 16.

[Drawing 18] It is the perspective view showing the approach to the reel of the light source unit of drawing 16 "cling."

[Drawing 19] It is the front view and bottom view showing the configuration of a light guide plate.

[Drawing 20] It is the explanatory view showing the example of production by back lighting.

[Drawing 21] It is the explanatory view showing the example of production by back lighting.

[Drawing 22] It is the explanatory view showing the example of the flash plate display using back lighting.

[Drawing 23] It is the block diagram showing the electric configuration of a slot machine.

[Description of Notations]

8a, 8b, 8c Reel

21 Light Source

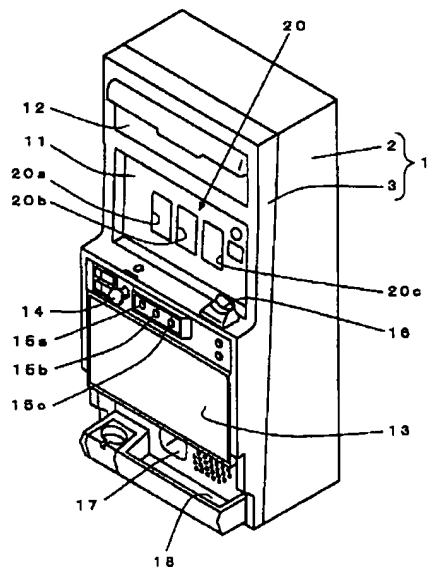
42 LED

46C Light source unit

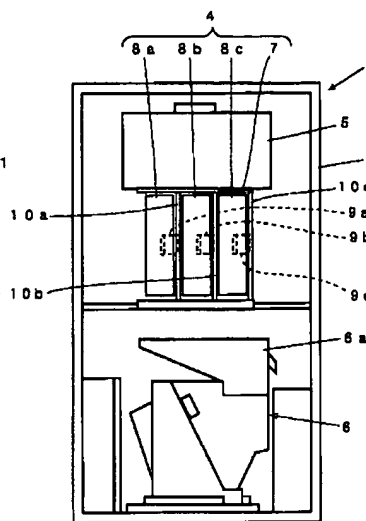
68a, 68b, 68c Light guide plate

[Translation done.]

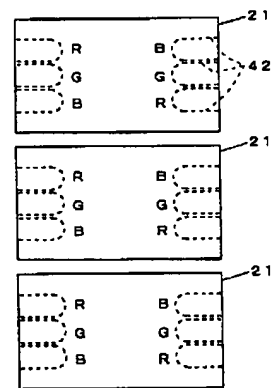
【図1】



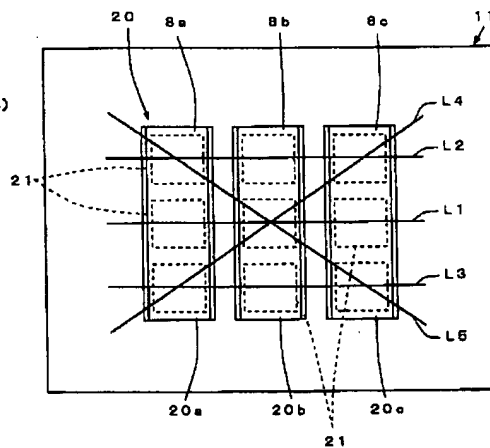
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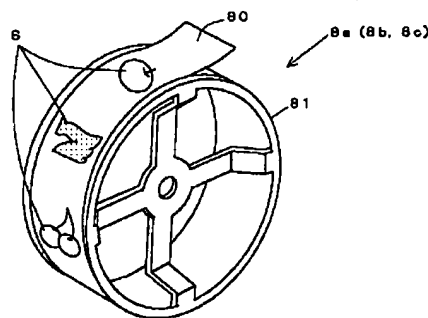
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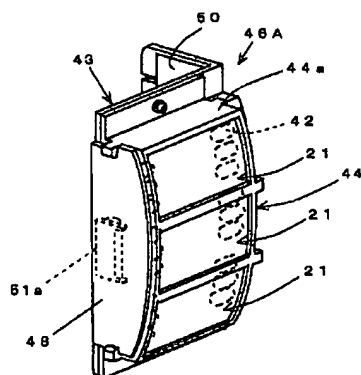
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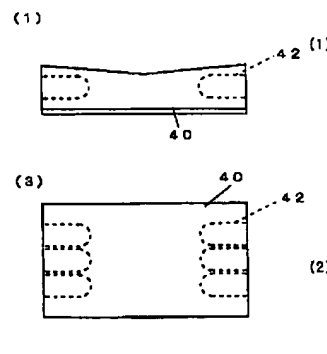
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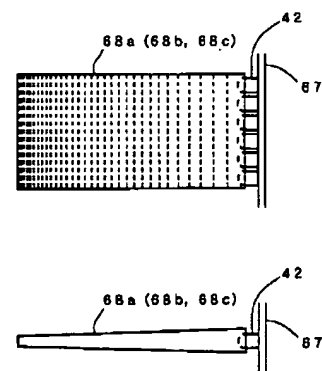
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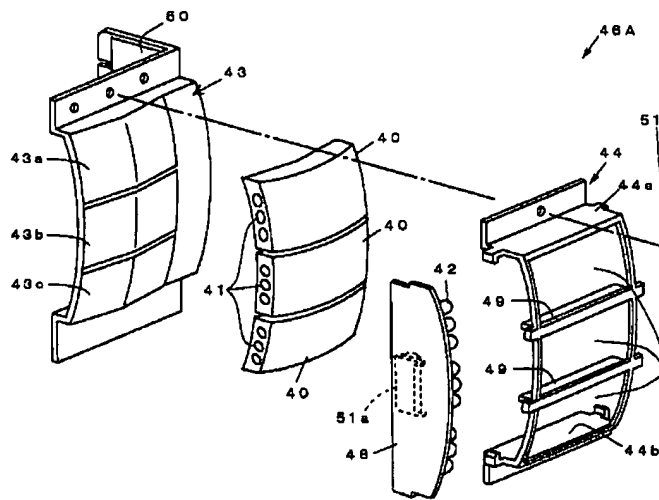
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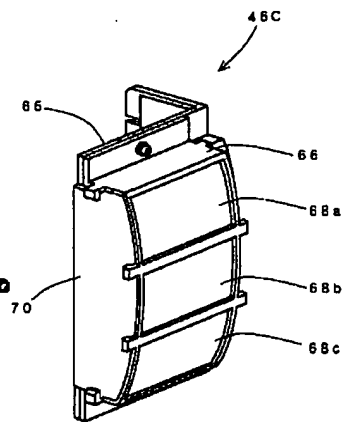
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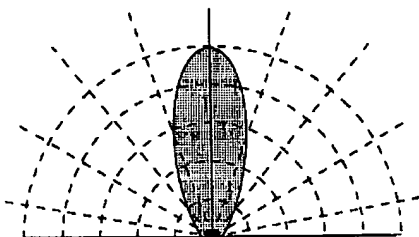
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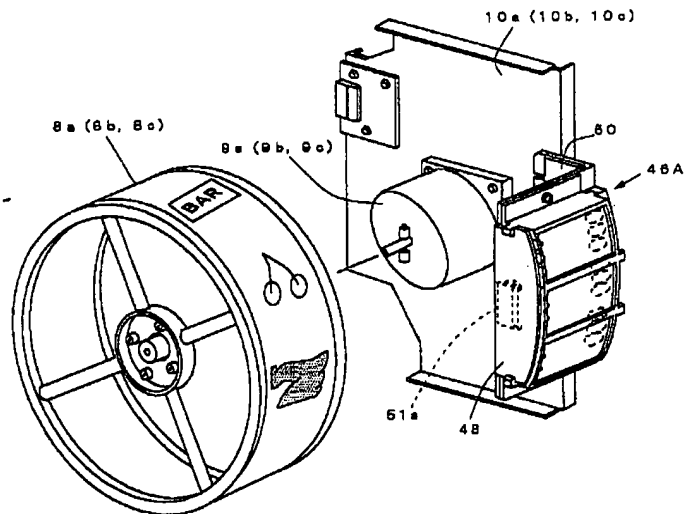
【図16】



【図8】



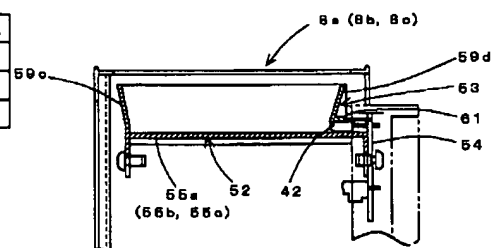
【図9】



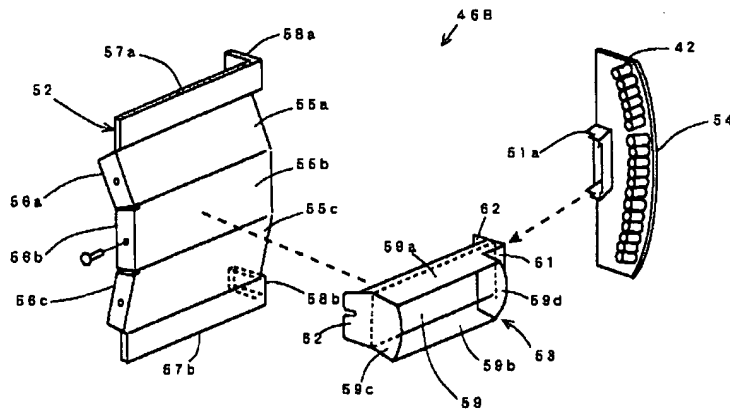
【図11】

発光色		白	黄色	水色	紫色	丸心色	波水色	波黄色	肌色	波緑色	波紫色
R	100	100	0	100	100	50	100	100	50	100	100
G	100	100	100	0	0	100	100	60	100	50	50
B	100	0	100	100	50	100	50	50	50	50	100

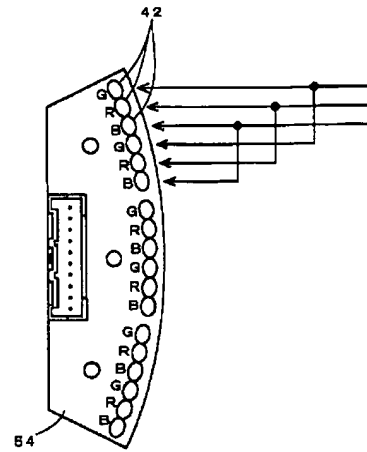
【図14】



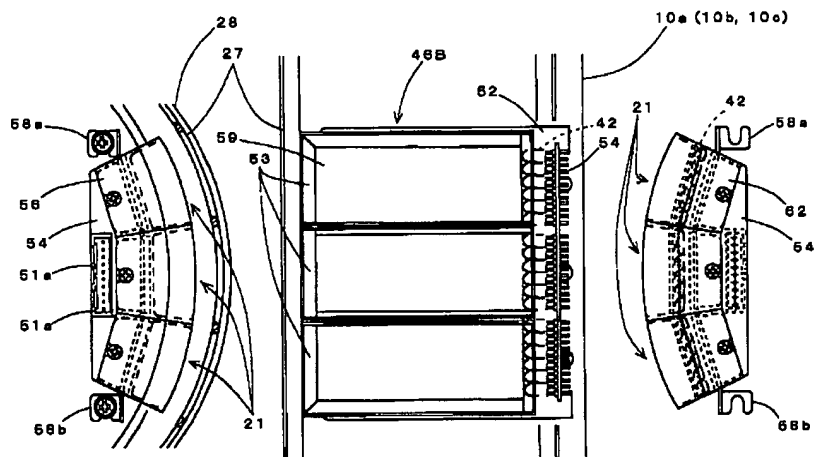
【図12】



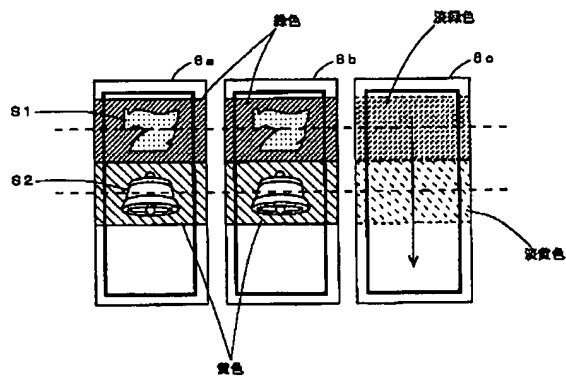
【図15】



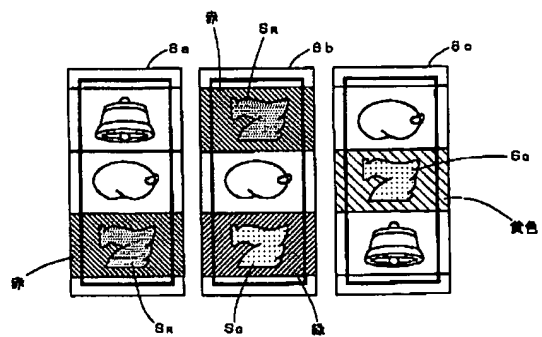
【図13】



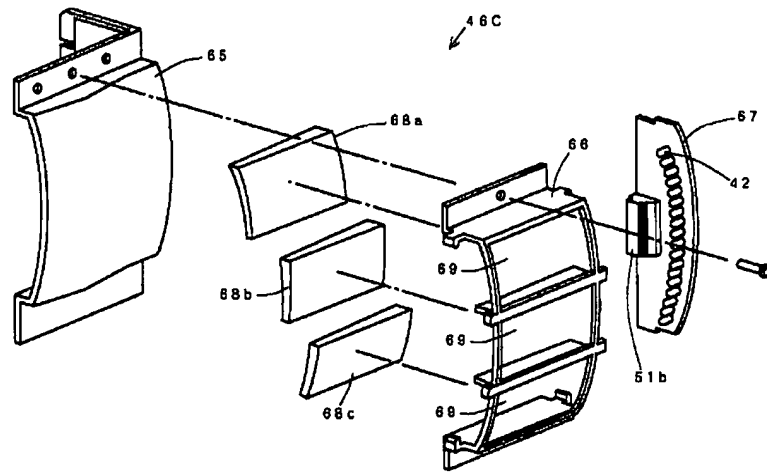
【図20】



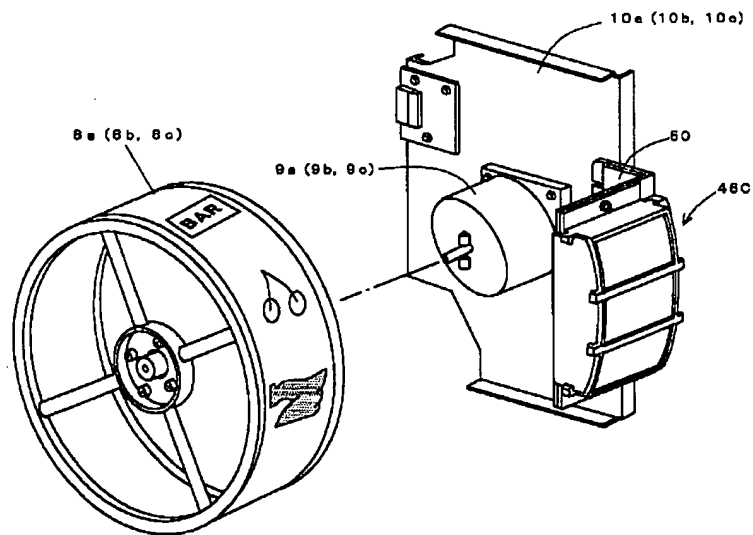
【図21】



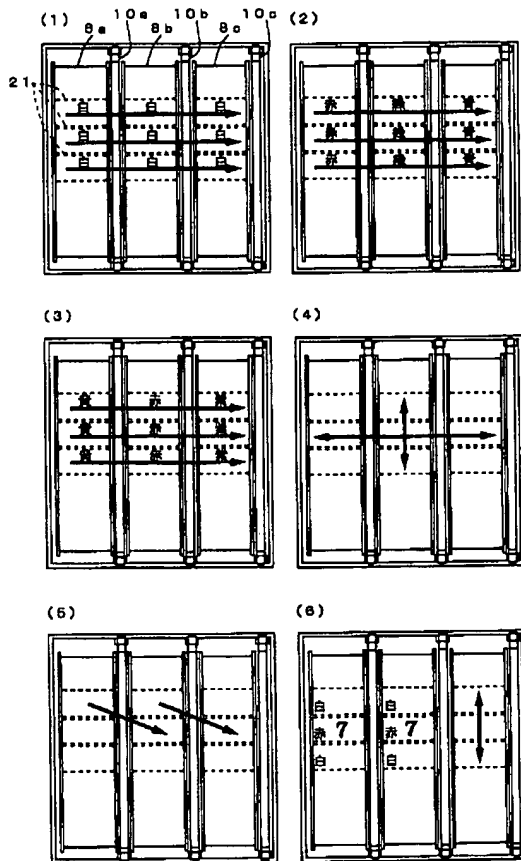
【図17】



【図18】



【図22】



【図23】

